



Commentary Article

Time to change to improve health: clinical pharmacy and pharmaceutical care education in Turkey

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The practice of clinical pharmacy had a positive impact on the profession by giving pharmacists more job opportunities. Moreover, the pharmacy began to gain the status it deserved, which was lost many years ago. In this paper, we aimed to give a brief explanation of the clinical pharmacy philosophy and definition of pharmaceutical care. What are the general and specific roles of clinical pharmacists in the modern world healthcare system? Also, how to implement clinical pharmacy in education to obtain competent pharmacists. We shared our observation and experience, specifically on the progress of implementation of clinical pharmacy education in Turkey. The stepwise method has been successfully followed in the implementation of clinical pharmacy education in Turkey. In the undergraduate program, the first step taken was the addition of clinical courses, such as the role of clinical pharmacy, patient education, etc. and practical hospital rounds (internal medicine, pediatrics, and surgery). The post-graduate program, such as master (MSc) and doctoral (Ph.D.) degrees, also offered to prepare clinically oriented pharmacy academicians. The continuous education programs were structured to implement clinical pharmacy idea for the pharmacists in practice. In conclusion, the stepwise approach significantly smoothed the transition from the product-oriented to the patient-oriented pharmacy education. Moreover, the adoption of the skills education system to educate pharmacists needs to review the policy regularly and gradually change it accordingly.

Keywords: Clinical Pharmacy, Pharmaceutical Care, Education, Stepwise Model, Patient-Oriented, Turkey

Background**Clinical pharmacy and pharmaceutical care**

Clinical pharmacy (CP) is a patient-oriented pharmacy service. Over the last several decades, multiple meanings made for clinical pharmacy. The European Society of Clinical Pharmacy (ESCP) described the activities and functions of developing and disseminating the rational and appropriate use of medical products and devices as CP. The American College of Clinical Pharmacy (ACCP) recognized as an authority in clinical pharmacy. ACCP defined clinical pharmacy as the area of pharmacy that concerned with the science and practice of rational medication use [1]. CP is a health science specialty where the pharmacist uses all pharmaceutical information for the benefit of patient care [2,3].

ACCP described the clinical pharmacist as the competent person who provides knowledge and skills in the health care system and therefore undertakes the role of consultant in drug treatment [1]. In other words, the clinical pharmacist uses their knowledge and the principles of pharmacology, toxicology, therapeutics, biochemical, and pharmaceutical care to ensure rational drug use [2,3]. The clinical pharmacist expressed as the

person who graduated from the faculty of pharmacy and took advanced pharmaceutical courses, biomedical courses, clinical internship, and assigned with the duties and responsibilities imposed by the clinical pharmacy [2,3]. The concept of clinical pharmacy often perceived as a hospital pharmacy due to the word "clinical". However, the clinical word in this terminology means patient-oriented. Nowadays, clinical pharmacy services are provided not only in hospitals but also in community pharmacies and all the other areas where pharmacists work [3,4]. In the mid-1980s, the concept of Pharmaceutical care (PC) emerged to facilitate the presentation of the knowledge and skills gained through clinical pharmacy education to patient care [3]. PC is known to be closely related to the clinical pharmacy. Hepler and Strand [2] first described pharmaceutical care in 1990 as the professional responsibility of the pharmacist in achieving therapeutic results that improve the quality of life of patients [2]. In his article published in 2004, Hepler [3] felt the need to redefine PC. The author pointed out the necessity of CP to perform PC and to deal with as a whole. Moreover, Robert Cipolle [5] and his colleagues successfully come with a new practice paradigm, through patient advocacy, support, and encouragement [5]. Since its appearance, evidence-based medicine played a fundamental role in most health education and medical practices. In this context, evidence-based pharmacy

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practice means that pharmacists respond to clinical problems through the use of the best scientific evidence. The physicians should meet the drug requests by making the most effective, safest, cost-effective, and appropriate recommendations to patients [1]. The more increasingly complex environment of health services, the provided services in this area cannot be based on personal opinions or experiences. Appropriate facilities should be submitted to each patient with evidence-based quality scientific research [1]. Three eras marked modern history for the pharmacy profession;

1. The period of traditional pharmacy (until the 1940s) in which natural (plant) based drugs produced.
2. The era of industrial pharmacy (1940-1976) in this period, science and technology developed, and the production of synthetic drugs accelerated [6,7].
3. The era after 1976, in which the patient-oriented pharmacy emerged.

The emerging pharmaceutical industry downplayed the traditional role of the pharmacists, directed pharmacists to narrow their field of work, and led them to search for new statements of work. In line with this trend, the pharmaceutical authorities in the US intended to introduce the concept of clinical pharmacy to bring serious responsibility to the pharmacy profession, such as a more active role in the treatment of patients.

Clinical pharmacy in the United States

In the US, the pioneers of this field were Whitney (1930) in Michigan and Clark (1940) from New York Hospital. However, the first initiatives in clinical pharmacy education held at the University of Nebraska in 1930 and the University of Washington in 1940. In 1976, CP included in the training program at the faculties of pharmacy in the United States of America [7,8,9].

The United States of America was the pioneer in the field of clinical pharmacy, either in education or implementation. According to the report of the American Council on Pharmaceutical Education (ACPE), the highest authority having the decision-making authority in this field, it is appropriate to grant the Pharmacy Doctor (Pharm.D.) to the pharmacist who is graduated after 2-4 years in a pre-pharmacy program and four years in a pharmacy program [10]. Furthermore, didactic classroom learning, and experiential training are combined in pharmacy education, specifically "Introduction to Pharmacy Practice Experience" training in community and hospital pharmacy settings for each of the first three years and "Advanced Pharmacy Practice Experience" as fourth-year rotations [11]. Moreover, since 2000, pharmacists need to obtain (Pharm.D.) degree in Pharmacy before being allowed to practicing pharmacy in the USA. Currently, all pharmacists in the US graduated with this title, also known as a clinical pharmacist [10,11].

Clinical pharmacy in Europe

Although clinical pharmacy education began in the United States of America, it spread rapidly to several other countries, including Europe. The teaching of clinical pharmacy carries the same philosophy; however, due to the lack of clinical pharmacists and many other barriers, the training of clinical pharmacy shows some differences in different countries. The

change in the curriculum includes adding some patient-oriented courses, and also some add clinical rounds as well. The European Society of Clinical Pharmacy (ESCP) was founded in 1979. ESCP represents the first concrete basis for the history of clinical pharmacy in Europe.

Clinical pharmacy in the United Kingdom

The United Kingdom (UK) was one of the first European countries to adopt the concept of clinical pharmacy, which spread to many countries of the world in the following years [12]. The pharmacy education system in the UK consists of 4 main sections. The first and second section of this education system is mainly theoretical education, where the basics of clinical pharmacy taught theoretically. However, the 3rd and 4th sections focus primarily on practical knowledge, where the clinical pharmacy and hospital visits take place.

Clinical pharmacy in Iraq

In Iraq, clinical pharmacy education started at Baghdad University in 1984. Professor Doctor Fikret V. Izzettin had a leading role in the development of clinical pharmacy by adding clinical pharmacy courses and hospital visits. Students in public or private universities need five years with ten semesters to complete a bachelor's degree (BSc) in pharmaceutical sciences. At present, in all Iraqi pharmacy colleges, the fourth and fifth academic year (in both the spring and autumn semesters) begins with clinical pharmacy subjects. Furthermore, students have to get weekly access to the teaching hospitals for the clinical training program and round table discussions regarding the major hospital wards. There is also a residency program after graduation in the clinical pharmacy [13,14].

Clinical pharmacy in Northern Cyprus

Clinical Pharmacy and PC experiential practice is a new concept in Northern Cyprus [15]. Abdi et al. reported the introduction of advanced pharmacy practice experience into pharmacy curricula [16]. Objective Structured Clinical Examinations (OSCE) used to assess student competence [15,16].

World health organization and clinical pharmacy

The term clinical pharmacy mentioned in organization meetings held in India and Japan in 1988 and 1993, respectively. The importance of the CP concept has been underlined with a statement of "Clinical Pharmacy or patient care and their importance for pharmacists." In 1997, the World Health Organization (WHO) held another meeting in Canada, with the main topic of "Role of the Pharmacist in the Health System" [17]. In the report of this meeting, the role of the pharmacist and the changes that should be made in pharmacy training and education for the future pharmacist have been discussed. Furthermore, WHO published the booklet named "Developing Pharmacy Practice, to focus on patient care" in 2006. WHO made the definition of CP in the pharmacist's role in healthcare services.

Clinical roles of pharmacist to improve health

The clinical pharmacists, especially in the USA, developed many patient-oriented health services in the hospital and community pharmacies. PC services have seen as the primary

mission of clinical pharmacist [1] aimed to improve treatment, reduce toxicity, and reduce the cost of health services. Although most of the developed and developing countries follow the same set of standards, the level of the provided services varies because of the insufficient number of qualified personnel and the lack of standard practice guidelines [18].

In recent years, PC has been going through many improvements and changes to take responsibility for inpatient care. Pharmacists involved more in PC practice and interacting more with the patient during drug therapy [19]. Gilani et al. [20] indicated that the role of clinical pharmacy was prominent in inpatient management, patient care, and clinical outcomes such as disease prevention, wellness promotion, and drug therapy management. Extensive clinical research and practice implementation projects have demonstrated the positive effect of clinical pharmacy in terms of health expenditure and the general patients' health status.

The functions and skills required to practice PC have been discussed extensively at the San Antonio consensus conference conducted by the American Society of Hospital Pharmacists (ASHP) and the ASHP Research and Education Foundation in Texas, March 12-15, 1993 [21]. Moreover, the professional activities of pharmacists were analyzed and documented by the practitioner task force of the Scope of Pharmacy Practice Project (1992-1994) [22]. Additionally, both ASHP clinical skills program and ASHP guidelines on a standardized method for pharmaceutical care have broadly explained the pharmacist's functions in a more detailed manner [23].

The ASHP guidelines provide the methods to be used in acute care (hospitals), ambulatory care, home care, long-term care, and other practice settings by ASHP. The function can be customized for each practice. The applicable standardization would depend on the practice location, service regulation, working relationship with other health professionals, financial abilities of the health system and patient, and the policies and procedures of the health system [23].

The PC services consist of several points, including the record, collect, and organize patient-disease related information. Then the clinical pharmacist identifies if there are any problems related to the therapy, figure out the healthcare needs of the patient, specify pharmacotherapeutic goals, draw a pharmacotherapeutic plan, and layout a monitoring plan. After setting the plan, the clinical pharmacist works with the cooperation of other health professionals, to apply the pharmacotherapeutic regimen and to follow up on the expected effects of the system design and monitoring plan according to the patient's need [23].

The clinical signs and laboratory results are evaluated regularly by the clinical pharmacist to see if the plan works correctly. The pharmacist monitors the progress to get the aimed outcomes, and the results documented on these shall be written. If modification on the plan is needed, the pharmacist should establish a follow-up with the patient and other healthcare providers by using an appropriate mechanism [1]. Recently, Medication Therapy Management (MTM) has emerged as a new concept for pharmacy administration in the United States. In 2004, 11 pharmaceutical organizations of the United States agreed to define MTM as a different service or group of services that optimize therapeutic outcomes for individual patients. This model promotes patients to take an

active role in their medication management. In the MTM model, the evaluation of all medication therapy collectively instead of one drug used by the patient. MTM is a collection of all patient-oriented services which must be given by pharmacist (patient education, disease management, and pharmaceutical care) and constructed according to the philosophy of pharmaceutical care [24].

Education of Clinical Pharmacy in Turkey

The concept of CP and patient-oriented pharmacy in Turkey introduced at the beginning of the 1990s with the tremendous efforts of Professor Doctor Fikret Vehbi Izzettin, a previous professor of CP at Marmara University, Istanbul. However, there is strong evidence that the history of clinical pharmacy in Turkey dated back to mid of the nineteenth century. The pharmacists were attending clinical rounds and performing clinical practice in "Gureba-i Müslimin Hospital", the first modern hospital for Muslim people of the Ottoman Empire founded by Bezmialem Valide Sultan in 1845. The primary purpose of this hospital to serve the poor and needy with no charge. According to the official records of "Gureba-i Müslimin Hospital", the pharmacists' rounding mentioned as a daily obligation. The pharmacists were attending daily rounds with doctors and taking an active role in inpatient care [25].

With a significant effort of Prof Dr. Fikret Vehbi Izzettin, the Faculty of Pharmacy at Marmara University was the first that decided to reconfigure the education to patient-oriented education. The University of Marmara recruited the stepwise process model to implement the philosophy of clinical Pharmacy and PC. The strategy was to introduce the 'clinical pharmacy' idea in the undergraduate curriculum and starting the graduate program to create specialists in this field [26]. Since 2005, the program of undergraduate pharmacy education in Turkey extended to five years. The program more about clinical content such as courses of clinical pharmacy, pharmacotherapy, pharmaceutical care, patient education, professional communication skills, etc. A scientific and efficient base has been established to implement CP [23].

The first lectures of CP within the department of biochemistry starting from 1991. The first sub-division of CP in Turkey established under the Department of biochemistry then pharmacology at the Faculty of Pharmacy of Marmara University in 1995. In 2013, the clinical pharmacy became a department, and the first clinical pharmacy department was established Marmara, Hacettepe and Inonu universities. In 2014, an addition had made to the Turkish Law (No. 6197) on Pharmacists and Pharmacies dated 18.12.1953 [27]. The new law addition considered a significant development in clinical pharmacy in Turkey predisposing to the initial steps of Clinical Pharmacy residency (specialty) education and practice; however, the program was broadly implemented in 2017 [27].

In Marmara University, the pharmacy undergraduate curriculum, both the clinical pharmacy I and II are compulsory courses at the pharmacy undergraduate level since 2000. In the 4th year, theoretical education of clinical pharmacy is given in the fall semester, while the hospital round offered in the spring semester. Training at the hospital setting includes the presentation of a variety of chosen cases from internal medicine, pediatrics, cardiology, neurology, and oncology services. Students improve their professional skills and

knowledge on case studies, drug information, and patient education as part of their training in pharmacy practice and participation in problem-based learning sessions [26]. However, during the 5th year, students are obligated to do clinical practice in University Hospital or the Training and Research Hospital.

The students who are willing to study the clinical Pharmacy and PC module must take the below-given courses:

1. Principles of pharmaceutical care.
2. Clinical pharmacy and drug information.
3. Patient education and monitoring.

In the 2010-2011 academic year, the Bezmialem Vakif University (BVU) started its academic life in the historic "Gureba-i Müslimin Hospital". BVU, Faculty of Pharmacy planned clinical pharmacy courses (both theoretical and hospital rounds) in its curriculum since 2010. BVU has configured the education system to start a clinical pharmacy course from 1st year of pharmacy school. Principles and philosophy of clinical pharmacy have been spread around all five years by adding some class hours in different courses within the first three years. Moreover, in the 4th, 5th year, intensive clinical knowledge, and clinical rounds take place. This configuration mainly focused on giving patient-oriented philosophy early as possible to the students distinguishing it from other Turkish universities.

For postgraduate programs, the Master (MSc) and Doctorate (Ph.D.) programs in Clinical Pharmacy have been approved in Marmara University since 1996. So far, more than 150 M.Sc. (with or without thesis), and 10 Ph.D. degrees in clinical pharmacy given by Marmara University. These efforts made a visible discipline of clinical pharmacy in the minds of Turkish pharmacists all over Turkey. The Master of Science program in clinical pharmacy is also available in Ankara, Yeditepe, Istanbul, Medipol, Hacettepe, Ege, Anadolu, Near-East, and BVU, while the Ph.D. program is available at Hacettepe University, Istanbul Medipol University, Ankara University and Near-East University (Turkish Republic of Northern Cyprus) [26].

Society of Clinical Pharmacy was established in 1998 to promote clinical Pharmacy in Turkey. Since 2003, many programs on clinical Pharmacy and PC education have been organized by the Turkish Pharmacists' Association Academy of Pharmacy. Over 1300 pharmacists have been attending these programs. However, there are many pharmacists in practice in Turkey, have not taken the basic knowledge of PC and clinical pharmacy education yet. Apart from these, a variety of scientific research has been carried out about clinical Pharmacy and PC in Turkey [28]. Society of Clinical Pharmacy organized three clinical pharmacy symposiums at the national level in 2005, 2013, and 2017, and one international symposium 36th European Symposium on Clinical Pharmacy in 2007 in Turkey. Symposium held in collaboration with Marmara University and the Turkish Pharmacist Association.

Conclusion

The Healthcare system and treatment are getting complicated each day; however, the pharmacist's intervention could only ensure improvement in the compelling treatment regime. The growing changes in the healthcare system led the pharmacist to practice in a patient-oriented manner. Although the US has topped the way toward the new approach of pharmacy since the mid-twentieth century, however Europe and other countries,

including Turkey, developed their model by adjusting the American system according to their circumstances. The noticeable changes in clinical pharmacy philosophy were in the education system, followed by working settings build-up towards the patient's needs. However, to implement the patient-oriented services, pharmacist requires a structured education model which could meet the needs of the country. The model used in changing education in Turkey was a stepwise approach supported by the initiation of graduate education to prepare clinically oriented teaching staff.

Moreover, this approach can be a model for transition from product-oriented education to patient-oriented education for pharmacy school. The positive effect of clinical pharmacy was evident in improving the health status and economic impact by adopting the principles of controlling the use of the drug, reducing medication-related problems, and sharing the responsibility with the medical team. The clinical pharmacy needs to be applied not only in hospitals but also in every field where the drug and patient were present.

Abbreviations

CP: Clinical Pharmacy ESCP: The European Society of Clinical Pharmacy ACCP: The American College of Clinical Pharmacy PC: Pharmaceutical Care ACPE: American Council on Pharmaceutical Education ESCP: The European Society of Clinical Pharmacy OSCE: Objective Structured Clinical Examinations ASHP: The American Society of Hospital Pharmacists MTM: Medication Therapy Management WHO: World Health Organization BVU: Bezmialem Vakif University

Declarations

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